

# New records of the Critically Endangered *Leptagrion acutum* Santos, 1961 (Odonata, Coenagrionidae) from southern Bahia, Brazil

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## Abstract

*Leptagrion acutum* Santos, 1961 is endemic to Brazil and, since 2003, listed as Critically Endangered in the Red Book of Threatened Brazilian Fauna. In this study, *L. acutum* is recorded for the first time from the state of Bahia, expanding known occurrences of this species to northern areas of the Atlantic Forest. Three males were collected in the Veracel Station Private Reserve of Natural Heritage. Information concerning distributional records of rare or endangered species is essential because it can add to species' occurrence records and assist in future Red List assessments.

## Keywords

Atlantic Forest, damselfly, distribution records, endangered species, phytotelmata, Zygoptera

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## Introduction

The genus *Leptagrion* Selys, 1876 (Odonata, Coenagrionidae) has 17 described species and has been recorded in coastal areas of South America, from Venezuela south to Brazil, where it is highly diverse in the Atlantic Forest (Garrison et al. 2010; Lencioni 2017a; Furieri et al. 2020). The reproduction and development of these species depend on phytotelmatic habitats, and breeding is mainly in bromeliads (De Marco and Furieri 2000). However, the destruction and degradation of native habitats and the illegal extraction of bromeliads may lead to local extinctions because most *Leptagrion* species are endemic and their populations are small (Galindo-Leal and Câmara 2003; Furieri 2008; Lencioni 2017a; ICMBio 2018).

*Leptagrion acutum* Santos, 1961 is endemic to Brazil, with few records and very small populations (Costa and Garrison 2001; Furieri 2008; Lencioni 2017a). This

species was described with no additional data other than Brazil as its type locality and was based on a holotype in the entomological collection of the Museu Nacional (UFRJ, Rio de Janeiro, Brazil) (Santos 1961). Since then, in 1969 and 1971, two males were collected in Conceição da Barra in the Espírito Santo state (Costa and Garrison 2001). Since 2003, *L. acutum* has been on the list of endangered species and is categorized as Critically Endangered in the Red Book of Threatened Brazilian Fauna (ICMBio 2018). This assessment indicates that populations of this species are severely fragmented due to a continuous decline of native vegetation caused by agriculture and urbanization and the loss of habitat quality in its probable areas of occurrence (ICMBio 2018).

In 2005, the *Leptagrion* Project was launched in partnership with the Atlantic Forest Research Institute and



approved by the National Environmental Fund in order to obtain more information on the distribution and populations of *Leptagrion* species. In this project, *L. acutum* was rediscovered after 34 years in Conceição da Barra, in Reserva Biológica Córrego Grande (REBIO), a federal conservation unit in the state of Espírito Santo (Furieri 2008; Furieri et al. 2020). The *Leptagrion* Project also extended its activities to southern Bahia, but it was unsuccessful in finding new records in that region (Furieri 2008). Therefore, we aim to expand the distribution of *L. acutum* to southern Bahia and describe the place where specimens were collected.

## Methods

The specimens were collected at the Veracel Station Private Reserve of Natural Heritage (Portuguese acronym RPPN), which is located between the municipalities of Santa Cruz Cabrália and Porto Seguro in southern Bahia, Brazil (Fig. 1). The RPPN Veracel Station is considered the largest private reserve in the Northeast Region of Brazil and the second largest in the Atlantic Forest biome (Veracel 2016). The RPPN covers an area of 6,069 ha and consists of dense tropical rainforests, which, despite being homogeneous, exhibits tableland forest with gallery forests (Veracel 2016).

The specimens were collected in September 2018 and February 2019 using an entomological net. They were packed in entomological envelopes and taken to the

laboratory for identification, which followed the specifications of Lencioni (2006, 2017b). The specimens are deposited in the zoological collection of the State University of Santa Cruz in the Laboratory of Aquatic Organisms (LOA). Sampling was authorized by Biodiversity Authorization and Information System (SISBIO), with license number 57179-1.

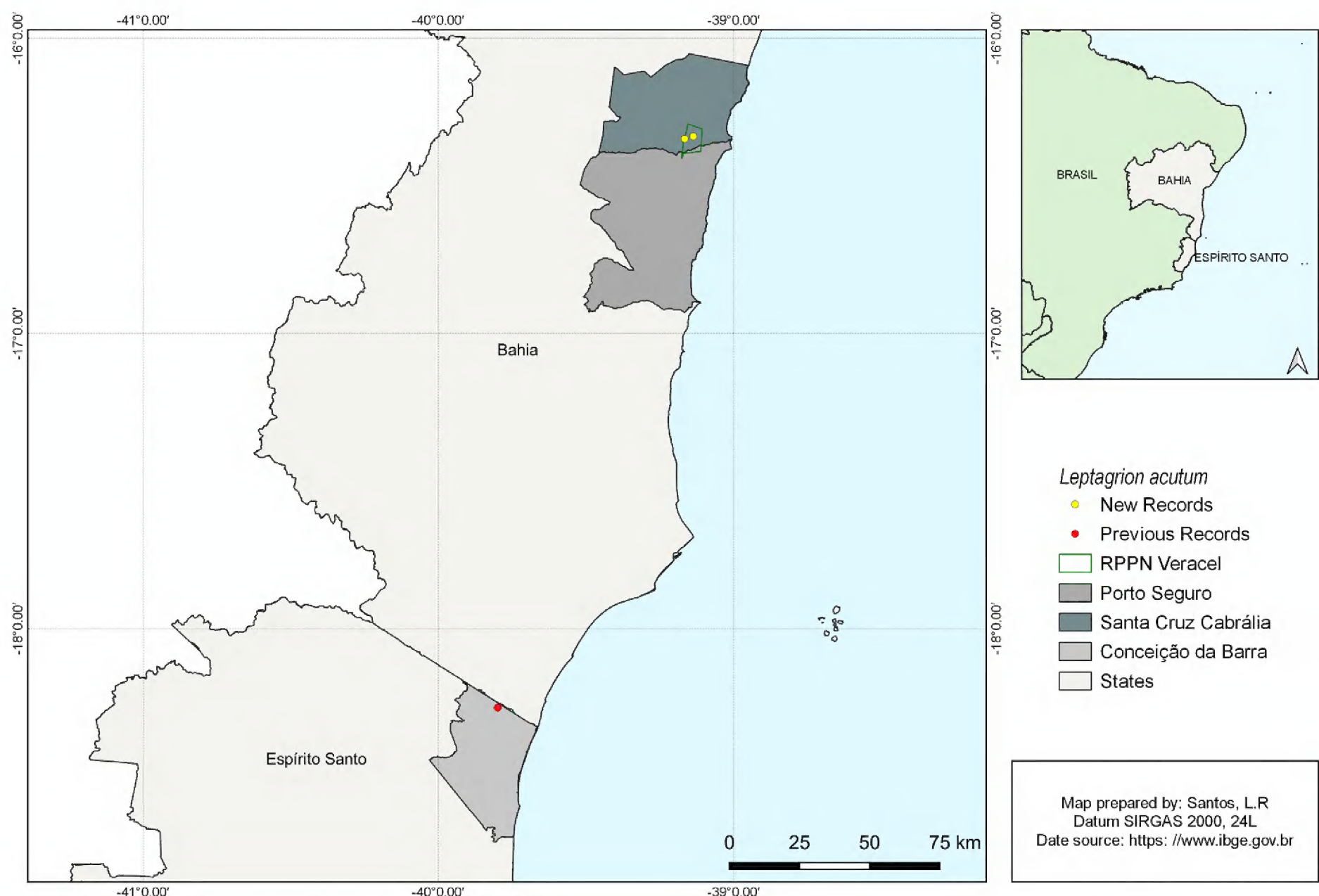
## Results

### *Leptagrion acutum* Santos, 1961

Figure 2

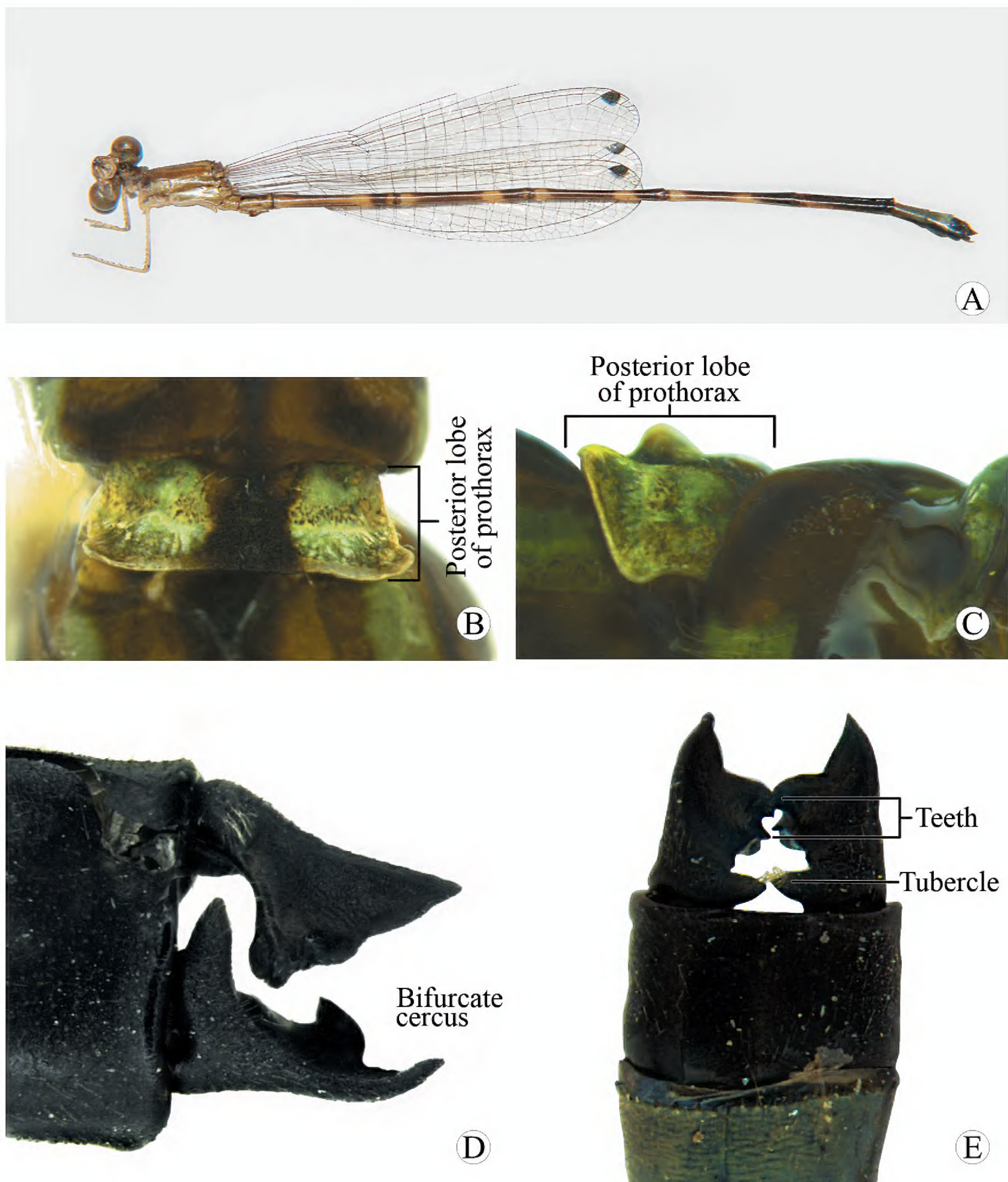
**New records.** BRAZIL • 2 ♂; Bahia state, Porto Seguro, RPPN Veracel Station;  $-16.3406$ ,  $-039.1656$ ; 95 m a.s.l.; 09 Sep. 2018; M.E. Rodrigues leg.; CZUESC 079BA, 080BA. • 1 ♂; same data;  $-16.3322$ ,  $-039.1361$ , 75 m a.s.l.; 02 Feb. 2019; M.E. Rodrigues leg.; CZUESC 586BA.

**Identification.** The species' identification was based on the caudal appendages and the posterior lobe of the prothorax. The posterolateral angle of the posterior lobe in dorsal view is slightly rounded and the posterior margin is almost straight (Fig. 2b). In lateral view, the posterior lobe is slightly tilted upwards (Fig. 2c). The internal margin of the male cercus bifurcates at 2/3 of its length into a large dorsal branch and a thinner, tapering ventral one (Fig. 2d). In dorsal view, the dorsal branch appears as a large, acute tubercle covered with a small tuft of hairs which are directed distally. From the medial border



**Figure 1.** Map of southeastern Brazil, including parts of the states of Espírito Santos and Bahia, showing records of *Leptagrion acutum* Santos, 1961. Previous records in red; new records in orange.





**Figure 2.** Male of *Leptagrion acutum* Santos, 1961 from RPPN Veracel Station, Bahia, Brazil. **A.** Habitus in lateral view; scale bar = 10 mm. **B,** **C.** Posterior lobe of prothorax in dorsal view (**B**) and lateral view. **D, E.** Caudal appendages in dorsolateral (**D**) and dorsal (**E**) views.

of the ventral branch stems two stout, subterminal teeth which are directed inward (Fig. 2e).

## Discussion

The specimens, which were usually resting on the vegetation in clearings in the forest, were observed and collected close to two of the trails used for monitoring the RPPN Veracel Station. *L. acutum* apparently occurs in low population densities inside the RPPN. Only three specimens were observed and collected in more than 30 days of sampling in different seasons of the year (September 2018; February and August 2019). Costa and Garrison (2001) and Furieri (2008) noted the same seasonality, and they recorded only two specimens, all

males, in each of their studies. Until now, *L. acutum* only has been recorded in 1969 and 1971 from Conceição da Barra, Espírito Santo (Costa and Garrison 2001), and in 2005 and 2006 (this time in the Corrego Grande Biological Reserve; Furieri 2008; Furieri et al. 2020). Our new records from the RPPN Veracel Station are the first from Bahia state.

RPPN Veracel Station is very important in preserving the biodiversity of the Atlantic Forest in southern Bahia because it is in a strategic area forming corridors with others RPPNs and with Pau Brasil National Park. Therefore, RPPN Veracel Station increases the size and effectiveness of protected areas for the maintenance and preservation of the region's biodiversity, especially endangered species (Veracel 2016). According to



the Red Book of Threatened Brazilian Fauna, *L. acutum* has a restricted distribution, with an extent of occurrence (EOO) estimated at 40 km<sup>2</sup> (ICMBio 2018). Our new records are 345 km at north in straight line from REBIO Conceição da Barra in the Espírito Santo.

Protected areas are extremely important for conserving biodiversity, especially for threatened species. The Atlantic Forest has suffered for decades with the loss of native areas and with the current neglect of politicians in the creation of new protected areas and maintenance of existing ones (Pinto and Kompier 2018). Our new records of *L. acutum* reaffirm the importance to maintain and encourage the creation of protected areas, such as the RPPN Veracel Station, for preserving the biodiversity of the Atlantic Forest. By extending the distribution of *L. acutum* to a much larger area than previously known, these new records important for future Red List assessment of this species, as well as for determining threats.

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## Authors' Contributions

CRS and MER collected and analyzed the data, wrote, revised, and approved the final version of the manuscript. LRS collected and analyzed the data, edited the map, revised, and approved the final version of the manuscript.

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